

## Radiology Corner

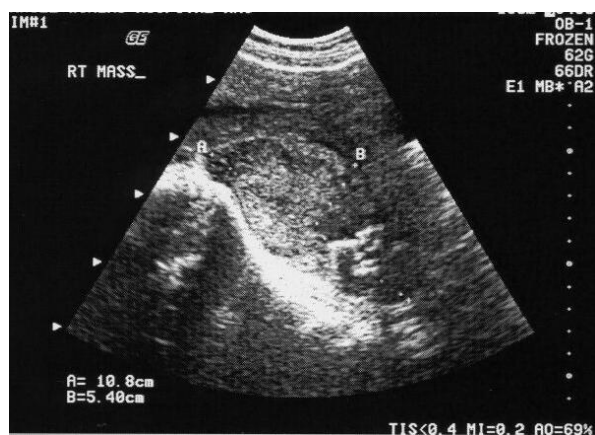
### Lithopedion

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*Note: This is the full text version of the radiology corner question published in the January 2010 issue, with the abbreviated answer in the February 2010 issue.*

We present a case of a pelvic lithopedion. Our 29-year-old G2P1 female (with a family history of endometriosis) presented with intermittent bouts of abdominal pain during the 1<sup>st</sup> and early 2<sup>nd</sup> trimester. Her maternal serum alpha-fetoprotein level obtained at 16.3 weeks' gestational age was markedly elevated (>27 Multiples-of-the-Median [MoM]). On her 18-week obstetrical ultrasound examination, a viable intrauterine pregnancy was noted with gestational age of 19 weeks; however, a 10.8 x 5.4cm bilobed mass was noted in the right pelvic cul-de-sac suggestive of a non-viable heterotopic pregnancy. She was managed conservatively. Three months after delivery, she was re-imaged with pelvic magnetic resonance imaging (MRI), and the extrauterine fetus in the right cul-de-sac was noted to be significantly smaller. This case demonstrates a rare example of a chronic pelvic ectopic pregnancy (lithopedion).



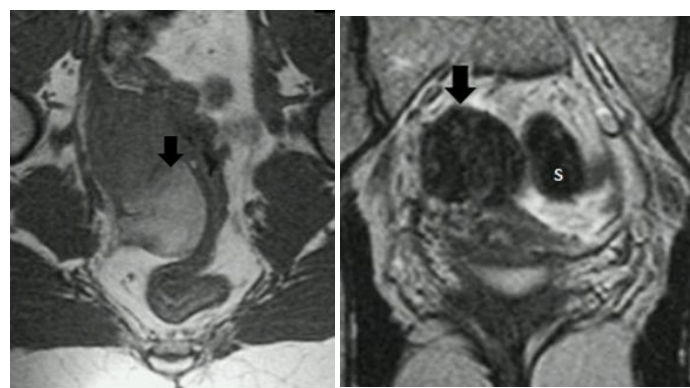
**Fig. 1a** Grayscale transabdominal ultrasound (transverse plane) of the right pelvic cul-de-sac revealing a 10.8 x 5.4cm bilobed mass suggestive of a fetus in the cephalic position. Doppler US revealed no fetal cardiac activity.



**Fig. 1b** Grayscale endovaginal ultrasound (longitudinal plane) of the right pelvic mass demonstrating linear segmented hyperechoic structures within the mass suggestive of a fetal spine (white arrow).

### Summary of Imaging Findings

Pelvic ultrasound (Fig. 1) demonstrates a bilobed extrauterine mass containing linear segmented hyperechoic structures suggestive of a fetus (with fetal spine). Pelvic MRI (Fig. 2) demonstrates that the mass has a fetal shape and contains fetal structures (cephalic position).



**Fig. 2** Pelvic MRI (left image-T1w axial, right image-T2w coronal) demonstrating the extrauterine mass (black arrows) adjacent to the sigmoid (s) colon. The mass has a fetal shape and contains fetal structures (cephalic position).

The above sonographic and MRI findings are consistent with a chronic pelvic ectopic pregnancy (ie. pelvic lithopedion). The patient's abdominal pain subsided, and she remains in good health.

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## Discussion

Ectopic pregnancy is a common condition that is encountered worldwide. Most cases of ectopic pregnancy involve a single extrauterine embryo and are discovered early in the course of the pregnancy. Classic symptoms of vaginal bleeding and pelvic pain in a pregnant female usually lead to assessment of serum HCG levels and pelvic ultrasound. While the classic ultrasound finding of cardiac activity in an extrauterine embryo is pathognomonic, more often a cystic or solid adnexal mass is found in association with free pelvic fluid (Figs. 3,4).



Fig. 3 Transabdominal ultrasound image of the pelvis (transverse plane) demonstrating free pelvic fluid in association with a left (LT) adnexal mass found to represent an ectopic pregnancy. (UT=uterus) [image courtesy of Dr. David Weitz, Travis AFB, CA]



Fig. 4 Endovaginal ultrasound image of the pelvis (longitudinal plane) demonstrating complex free pelvic fluid (white arrow) in the cul-de-sac. (UT=uterus, BLADD=urinary bladder)

Often, the free pelvic fluid is reactive to the ectopic pregnancy. However, free fluid may also represent blood in the setting of a ruptured ectopic pregnancy (Fig. 5).



Fig. 5 Enhanced [oral & IV contrast] computed tomography (CT) scan of the pelvis (axial plane) obtained in the setting of a ruptured ectopic pregnancy. High attenuation (> 20 CT Hounsfield units) free pelvic fluid (\*) was found to represent acute hemorrhage at laparoscopy.

As most ectopic pregnancies are usually detected early in their course, laparoscopic removal of the ectopic pregnancy or ablative therapy (eg. methotrexate) is elected, resulting in disappearance of the extrauterine pregnancy.

In contrast, chronic ectopic pregnancy often resulting in formation of a lithopedion (litho = stone; pedion = child or "stone baby") is a fairly rare phenomenon. Lithopedion formation typically occurs in 1:20,000 pregnancies with fewer than 300 cases reported in the medical literature over the past 400 years. The condition was first described in a treatise by Albucasis in the 10<sup>th</sup> century AD. As the case in figures 1 and 2 demonstrates, the etiology is related to demise of an ectopic pregnancy; however, a lithopedion is more commonly encountered with a larger ectopic pregnancy, as can be seen with abdominal pregnancies.<sup>1</sup> When the fetus is too large to be reabsorbed by the body (usually gestational age > 14 weeks), the fetus and/or its covering membranes calcify, shielding the mother's body from the degenerating fetal tissue.<sup>2</sup>



Fig. 6 Enhanced [oral & IV contrast] computed tomography (CT) scan of the pelvis (oblique coronal plane) demonstrating a pelvic lithokelyphopedion. [image courtesy of Dr. Laughlin Dawes, Sir Charles Gairdner Hospital, Perth, Western Australia]

A calcified extrauterine fetus can have the following forms: (i) lithokelyphos (litho = rock, kelyphos = shell): only the ovular membrane is calcified and the fetus can be in different stages of decomposition; (ii) lithokelyphopedion: both are calcified, i.e. fetus and ovular membrane, as in this case; (iii) lithopedion: only the fetus is calcified. It is not unusual for a lithopedion to remain undiagnosed for decades.<sup>3</sup> A patient with a calcified extrauterine pregnancy may present with abdominal pain, lower abdominal pressure, or constipation.<sup>4</sup> Based on reported cases, the patient's age at the time of diagnosis ranges from 23 to 100 years; 67% of the patients are over the age 40 years. The estimated lead time to diagnosis ranges from 4 years to 60 years.

Fetal demise occurred between a gestational age of three to six months in 20% of the reported cases, between seven and eight months in 27%, and at full term in 43%. The earliest lithopedion found was in an archaeological excavation, dating to 1100 BC, antedating the first clinical description by 2100 years.<sup>5</sup> Based on reported cases, the patient's age at the time of diagnosis varies widely, with 67% of patients over forty years of age.

## Summary

Ectopic pregnancy is an important condition that is encountered worldwide. Most cases of ectopic pregnancy involve a single extrauterine embryo, but heterotopic pregnancy can also be encountered. Patients with ectopic pregnancy often present early in the course of pregnancy due to symptoms of pain and vaginal bleeding, and laparoscopic resection or ablative therapy (eg. methotrexate) is usually elected. These treatments result in the disappearance of the extrauterine pregnancy. Without treatment, demise of an ectopic pregnancy can result in formation of a calcified

extrauterine fetus (lithopedion). While rare, lithopedion is a condition that can be encountered with any imaging tool, and careful inspection of the internal features of pelvic masses may result in discovery of this diagnosis.

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